HAFNIUM STATISTICS

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[All values in metric tons (t) unless otherwise noted]

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Year	Production	Imports	Stocks	Government shipments	Apparent consumption	Unit value ($/t)	Unit value (98$/t)
1959	15.4				15	88,200	493,000
1960	31.8				32	88,200	485,000
1961					35	88,200	482,000
1962					38	88,200	477,000
1963		0.0594			41	165,000	878,000
1964	29.0	0.00318	3.6	15	44	165,000	868,000
1965	14.5	0.151	0.9	3	20.4	165,000	855,000
1966	14.5		0.9	0	15	165,000	829,000
1967	12.7	0.0236	0.0	1	14.6	165,000	805,000
1968	22.7	0.0767	4.5	1	19.3	160,000	751,000
1969	25.4	0.203	4.5	0	25.4	165,000	732,700
1970	31.8	0.120	10.0	0	26.3	165,000	693,300
1971	29.0	0.0771	9.1	0	29.9	165,000	664,000
1972	36.3	0.128	13.6	0	31.8	165,000	643,500
1973	37.2	1.10	19.1	0	29.0	165,000	605,700
1974	38.1	3.37	28.1	0	27.2	165,000	545,500
1975	33.6	0.0336	34.5		27.2	165,000	499,800
1976	27.2	1.48	36.3		25.4	165,000	472,600
1977	31.8	1.51	36.3		27.2	165,000	443,800
1978	36.3	0	36.3		36.3	182,000	455,000
1979	40.8	0.0526	36.3		40.8	182,000	408,600
1980	45.4	0.279	36.3		40.8	182,000	360,000
1981	45.4	2.41	36.3		40.8	215,000	385,500
1982	49.9	0	33.6		40.8	215,000	363,200
1983	49.9	0.217	33.6		45.4	215,000	351,900
1984	45.4	0.907	27.2		45.4	231,000	362,400
1985	45.4	0.907	27.2		45.4	231,000	349,900
1986	45.4	0	22.7		45.4	231,000	343,500
1987	45.4	1.00	27.0		42	187,000	268,300
1988		4.00	27.0		47	231,000	318,300
1989		4.00	27.0		48	231,000	303,700
1990		9.00			49	187,000	233,200
1991		3.00			50	187,000	223,800
1992		2.00			51	187,000	217,300
1993		3.00			52	187,000	210,900
1994		5.00			53	187,000	205,700
1995		5.00			54	187,000	200,000
1996		8.00			55	187,000	194,300
1997		7.00			57	187,000	189,900
1998		11.0			58	187,000	187,000
1999		9.36			59	187,000	183,000
2000		11.1			60	187,000	177,100
2001		5.09	35		61	130,000	120,000
2002		4.87			62	130,000	118,000

Hafnium Worksheet Notes

Data Sources
The sources of data for the hafnium worksheet were the mineral statistics publications of the U.S. Bureau of Mines and the U.S. Geological Survey—Minerals Yearbook (MYB), Mineral Commodity Summaries (MCS) and its predecessor, Commodity Data Summaries (CDS), Metal Prices in the United States through 1998 (MP98), and Mineral Facts and Problems (MFP). The years of publication and corresponding years of data coverage are listed in the References section below. Blank cells in the worksheet indicate that data were not available.

Production
U.S. hafnium commercial production started in 1952, with the former U.S. Bureau of Mines' pilot plant utilizing new technology to separate hafnium from zirconium. Data were from the MYB for the years 1959–60, the MFP for the years 1964–83, and the MCS for the years 1984–87. Data were for hafnium crystal bar and/or hafnium sponge. Data for the years 1970–87 were for hafnium crystal bar. Data for hafnium sponge for the years 1970–87 were not included because of the proprietary nature of the data. Blank cells in the worksheet indicate that data were not available for the years 1961–63 and 1988–2002.

Imports
Import data were for hafnium in unwrought and waste and scrap imported into the United States. Data were from the MYB. Blank cells in the worksheet indicate that data were not available for the years 1959–62 and 1966. Datum for the year 1986 was reported as less than one-half unit and appears as a zero due to rounding down.

Stocks
Stock data were for hafnium sponge and crystal bar and were for end of year stocks. Data were from the MFP for the years 1964–83 and from the MYB for the years 1984–89. Blank cells in the worksheet indicate that data were not available for the years 1959–63 and 1990–2002.

Government Shipments
Government shipment data were for hafnium oxide, sponge and shapes, crystal bar, and scrap. Data were from the MFP. Blank cells in the worksheet indicate that data were not available for the years 1959–63 and 1975–2002.

Apparent Consumption
Apparent consumption figures were developed based on the following considerations:

- Apparent consumption figures were limited to two significant figures based on broad assumptions that had to be made throughout the period covered for the years 1959–64, 1966, and 1987–2000.
- Apparent consumption was estimated for the years 1959–60, 1964–68, and 1987 by using the formula:

  APPARENT CONSUMPTION = PRODUCTION + IMPORTS ± GOVERNMENT SHIPMENTS ± STOCK CHANGES.

  Imports which were left blank for the years 1959–62 and 1966 were assumed to be zero, due to the low values for most of the other imports in the series.
- No import, stock or government shipment data were available for the years 1959–60 and were assumed to be zero when apparent consumption was calculated.
- Apparent consumption figures for the years 1961–63 were estimated by regression.
- The change of the amount of stocks in 1964 was assumed to be zero since stock datum for 1963 was not available.
- Apparent consumption was taken from the MCS and the CDS for the years 1969–86.
- No government shipment datum was available for the year 1987 and was assumed to be zero to calculate apparent consumption.
- Production data for hafnium sponge for the years 1970–87 were not included due to the proprietary nature of the data and therefore underestimate actual apparent consumption. The estimation of apparent consumption for the years 1988–2002 by using regression for the years 1964–87, also underestimates apparent consumption.

Unit Value ($/t)
Unit value is the value in current dollars of 1 metric ton (t) of hafnium sponge apparent consumption. Datum was estimated for the year 1959 by regression. Data were from the MP98 for the years 1960–98 and the MYB for the years 1999–2002.

Unit Value (98$/t)
The Consumer Price Index conversion factor, with 1998 as the base year, was used to adjust unit value in current U.S. dollars to the unit value in constant 1998 U.S. dollars.

References

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